IN THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A DNA chip, comprising:

a flat carrier ~~(2)~~; and~~, arranged along~~

an array ~~(3)~~ of spots ~~(4)~~ containing catcher molecules, each spot ~~(4)~~ being assigned a microelectrode arrangement ~~(5)~~ for detecting binding events between the catcher molecules and target molecules applied ~~by means of~~ via an analyte solution, ~~characterized in that~~ the electrode arrangement being ~~(5) is~~ at least partially embedded in a hydrophilic reaction layer ~~(14)~~ which is permeable to target molecules and in which immobilized catcher molecules are distributed three-dimensionally.

2. (Currently Amended) The DNA chip as claimed in claim 1, wherein ~~characterized by~~ a thickness of the reaction layer is ~~(14) of~~ 2 to 100 μm.

3. (Currently Amended) The DNA chip as claimed in claim 2, wherein ~~characterized in that~~ the reaction layer has a thickness laying approximately in the range of 1 to 5 L, ~~where~~ L being ~~is~~ the sum of electrode width and electrode spacing.

4. (Currently Amended) The DNA chip as claimed in claim 2 ~~or claim 3~~, wherein ~~characterized in that~~ the electrode width and the electrode spacing lie in the region of 1 μm ~~(≙ 1000 nm)~~ and wherein ~~that~~ the reaction layer has a thickness of between 2 and 10 μm.

5. (Currently Amended) The DNA chip as claimed in claim 3, wherein the microelectrode arrangement is~~being~~ a two-pole system, and wherein~~characterized in that~~ the reaction layer has a thickness of approximately 3 μm.

6. (Currently Amended) The DNA chip as claimed in claim 3, wherein the microelectrode arrangement is~~being~~ a four-pole system, and wherein ~~characterized in that~~ the reaction layer has a thickness of approximately 7 μm.

7. (Currently Amended) The DNA chip as claimed in claim ~~one of claims 1 to 6, characterized in that~~1, wherein the reaction layer ~~(14)~~ is thermally stable up to approximately 95°C.

8. (Currently Amended) The DNA chip as claimed in claim 1, wherein ~~one of claims 1 to 7, characterized in that~~ the reaction layer ~~(14)~~ contains coupling groups for the covalent binding of catcher molecules.

9. (Currently Amended) The DNA chip as claimed in claim 1, wherein~~one of claims 1 to 8, characterized in that~~ the reaction layer ~~(14)~~ is a hydrogel.

10. (Currently Amended) The DNA chip as claimed in claim 6, wherein~~characterized by~~ an acrylamide-based radical-crosslinkable hydrogel includes~~with~~ at least one of maleic anhydride and~~/or~~ glycidyl (meth)acrylate as coupling groups.

11. (Currently Amended) The DNA chip as claimed in claim~~one of claims~~ 1~~ to 10~~, wherein the electrode arrangement is ~~characterized by~~ an interdigital electrode arrangement~~ (5)~~.

12. (Currently Amended) The DNA chip as claimed in claim 11, wherein ~~characterized in that~~ the interdigital electrode arrangement is a two-pole microelectrode system.

13. (Currently Amended) The DNA chip as claimed in claim 11, wherein ~~characterized in that~~ the interdigital electrode arrangement is a four-pole microelectrode system.

14. (Currently Amended) The DNA chip as claimed in ~~one of~~ claim~~s~~ 1~~ to 13~~, wherein ~~characterized in that~~ the flat carrier includes~~(2) comprises~~ a semiconductor layer and an insulating layer ~~(13)~~ connected thereto, the insulating layer ~~latter~~ carrying the electrode arrangement ~~(5)~~ and the reaction layer ~~(14)~~ on its side remote from the semiconductor layer.

15. (Currently Amended) The DNA chip as claimed in claim 14, wherein ~~characterized in that~~ the semiconductor layer is a silicon layer ~~(12)~~.

16. (New) The DNA chip as claimed in claim 3, wherein the electrode width and the electrode spacing lie in the region of 1 μm and wherein the reaction layer has a thickness of between 2 and 10 μm.

17. (New) The DNA chip as claimed in claim 2, wherein the reaction layer is thermally stable up to approximately 95°C.

18. (New) The DNA chip as claimed in claim 2, wherein the reaction layer contains coupling groups for the covalent binding of catcher molecules.

19. (New) The DNA chip as claimed in claim 2, wherein the reaction layer is a hydrogel.

20. (New) The DNA chip as claimed in claim 2, wherein the electrode arrangement is an interdigital electrode arrangement.